

CALENDAR ITEM

98

A

10/19/12

Statewide

S

H. Wyer

STAFF REPORT ON INTERAGENCY COORDINATION ON MARINE DEBRIS— INCLUDING POTENTIAL EFFECTS OF THE JAPAN TSUNAMI

INTRODUCTION

The March 2011 Tōhoku Tsunami has brought the issue of tsunami debris and general marine debris to the attention of State Lands Commission (Commission) staff, other agency staffs at the local, state, and federal levels, and the public. Marine debris, including tsunami debris, can interfere with public trust uses of State tidelands such as fisheries, navigation, and recreation. In addition, tsunami debris raises the risk of marine invasive species' introduction in California. This report provides a summary of the current understanding of marine debris, issues specific to tsunami debris and its potential effects on public trust uses and values, and Commission staff's participation in marine debris coordination and management efforts.

MARINE DEBRIS

Marine debris is any long-lasting, human-made material that enters the ocean either directly or indirectly. The majority of marine debris is made of plastic or other material that does not degrade in seawater. Plastic is buoyant, allowing it to move with ocean currents, and very chemically stable. When plastic enters the ocean it breaks into small pieces as it is exposed to sunlight, but does not chemically degrade. Plastic often has "filler" chemicals associated with it which are released as it physically breaks down. These chemicals can be toxic to marine life and may accumulate in marine species. Plastic also accumulates oil-soluble pollutants such as DDT from surrounding seawater and carries them through the marine environment. When marine species ingest plastic, the pollutants associated with plastic are metabolized by the marine species and may accumulate in the animal's tissue. Ingestion by seabirds and other animals that accidentally eat the marine debris while feeding on natural food can also lead to starvation or malnutrition when the marine debris collects in the animal's stomach.

In addition to plastic, derelict fishing gear is a common form of marine debris. Because fishing gear is designed to last a long time in the ocean, lost nets and traps continue to catch and kill marine species. Derelict gear kills marine species through two methods: entangling species and re-baiting itself. Marine species that become entangled in fishing gear often die because they are unable to feed, breathe, or perform other essential life functions. When a marine species is caught in a net or trap, it also becomes "bait" for its

CALENDAR ITEM NO. 98 (CONT'D)

predators. When predators attempt to catch entangled or trapped prey, they can become caught in the gear as well.

TSUNAMI DEBRIS

The Tōhoku tsunami was, first and foremost, a human tragedy. The tsunami destroyed entire communities and the resulting debris reflects this wide-scale damage. The Japanese government estimates that the Tōhoku tsunami introduced 1.5 million tons of debris into the Pacific Ocean; some of this debris has since landed on shorelines, including along the west coast of the United States, or sunk. Fortunately, the tsunami debris is unlikely to have harmful levels of radiation from the Fukushima nuclear emergency. The debris had already moved far offshore by the time the nuclear emergency occurred at Fukushima. In addition, some large debris items that have reached the west coast have been tested for radiation, and no radioactive contamination above normal background levels was found.

Tsunami debris can be anything from framing lumber and building insulation to plastics, to medical or industrial waste, to marine infrastructure. However, the Japanese government also estimates that 90% of the floating tsunami debris is composed of parts of collapsed houses, such as framing lumber and driftwood. The concentrated fields of debris that were initially seen offshore of Japan have been dispersed and are no longer distinguishable, making debris very difficult to track.

Debris that floats higher in the water column experiences more influence and energy from the wind. The tsunami debris items that have experienced more influence from the wind have reached the west coast first. The National Oceanic and Atmospheric Administration's (NOAA) most recent debris location models are designed to predict the debris' current location, rather than where it may be in the future. NOAA runs these models once a month and posts the resulting maps on its tsunami debris website at (http://marinedebris.noaa.gov/tsunamidebris/debris_model.html). The most recent map of the debris is included in Exhibit A. A new report from Washington State Sea Grant states that roughly 75% of floating debris will remain in the North Pacific Gyre and will never reach land. Of the debris that does reach land, 50% of it is estimated to land in Alaska. No estimates were available for California from this report.

Some hazards may be associated with tsunami debris. Large floating debris offshore, such as derelict vessels and docks may be a navigational hazard to vessels. If large debris items are determined to be a navigational hazard offshore, the US Coast Guard would take action to manage the item. The actions taken by the Coast Guard vary on a case-by-case basis and involve coordination with appropriate agencies. The Coast Guard sunk a Japanese fishing vessel in Alaskan waters in April of this year. In addition to navigational hazards, the tsunami also washed out household, medical, and industrial hazardous waste from coastal communities. There are no estimates on how much hazardous debris was generated from the tsunami.

CALENDAR ITEM NO. 98 (CONT'D)

Marine Invasive Species

Tsunami debris of marine origin, such as vessels and docks, may enhance the spread of invasive species. Tsunami debris of marine origin may carry biofouling communities that are native to Japan but not established in California waters. Biofouling is the adhesion of marine organisms, including seaweeds, barnacles, and mussels, to hard surfaces. Although tsunami debris that is not of marine origin may have biofouling on it, the species will be from the open-water environment of the Pacific Ocean rather than the coastal environment of Japan, and so are less likely to become invasive in coastal ecosystems. Only tsunami debris that originally had a fouling community on it in Japan would carry species with potential to invade California.

The issue of invasive species as it relates to tsunami debris came to light in early June 2012 when a dock from Misawa, Japan washed up on Agate Beach in Oregon less than 200 miles north of California. The dock carried two tons of Japanese fouling species on it, including some that were already invasive in San Francisco Bay and others that are not on the west coast yet but are known as harmful species. Species on the dock that are of concern to California include: the Northern Pacific seastar (*Asterias amurensis*) and the Asian shore crab (*Hemigrapsus sanguineus*).

CALIFORNIA ACTIONS TO MANAGE TSUNAMI DEBRIS

Since the Commission's lands may be impacted by both general marine debris as well as tsunami debris, Commission staff is participating in the following interagency coordination and other efforts to manage debris and prevent or minimize the introduction of nonindigenous species to California State waters.

1. At the invitation of the Ocean Protection Council (OPC), staff is participating in the OPC's Marine Debris Steering Committee. In 2007, the OPC passed a resolution to reduce and prevent ocean litter; the Marine Debris Steering Committee was formed to develop a strategy and implement the OPC's resolution, because marine debris does not fall under any one agency's jurisdiction in California. The short term goal of the Steering Committee is to support the California Emergency Management Agency (Cal EMA) in working with local jurisdictions to prepare for the arrival of tsunami debris. Cal EMA is coordinating the state-level response to tsunami debris. Different aspects of the state level response are mentioned below:
 - **Cal EMA's Concept of Operations:** Cal EMA has prepared a draft Concept of Operations to determine how the state would respond to large or hazardous tsunami debris items; this document is currently at the Governor's office for review. The Concept of Operations states that landowners are responsible for cleanup of debris items on their property. However, large items (e.g., the dock on Agate Beach in Oregon) are likely to land below the mean high tide line, on the lands managed by the

CALENDAR ITEM NO. 98 (CONT'D)

Commission. The Japanese government donated \$6 million in September, 2012 for tsunami debris cleanup in impacted coastal states, and this could become a funding source for future cleanups, if necessary.

- **Coastal Commission and Beach Cleanups:** The Coastal Commission has obtained federal funding from NOAA to expand its Adopt-a-Beach program, which allows for volunteer groups to remove non-hazardous debris. The Coastal Commission has also created specific guidelines for tsunami debris removal for volunteer groups.
2. Staff is participating in the NOAA tsunami debris update calls to monitor the current location of debris, recent sightings of debris, and various federal and state responses to debris. To prepare for the increased risk of introducing marine invasive species, the NOAA marine debris program assembled a regional group of experts, including Commission staff, to prepare protocols and standards for handling invasive species on tsunami debris. The protocols were finalized at a workshop in Portland, in July 2012. The associated report, Japanese Tsunami Marine Debris Biofouling Protocols, is receiving final comments now. Once the report is complete, it will be distributed to workshop attendees, including Commission staff, and others upon request.
 3. Staff is participating in the Japanese Tsunami Marine Debris Taxonomic Assessment Team (J-TAT). The J-TAT was created by one of the protocols mentioned above, and provides rapid expert opinion on the threat posed by fouling organisms on debris. This group, reviews images of sighted potential tsunami debris and determines if fouling organisms are of concern as potential invasive species.
 4. Staff will continue to monitor potential grant opportunities and where feasible will seek funds to continue its work related to marine debris, particularly as it relates to marine invasive species prevention and control.

CALENDAR ITEM NO. 98 (CONT'D)

EXHIBIT A

**NOAA MARINE DEBRIS PROGRAM'S MOST RECENT MODEL OF WHERE
TSUNAMI DEBRIS IS LOCATED**

